Mar: '50

The College Board Review

37,809 CANDIDATES IN MARCH

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Five Million Tests In First Eighteen Months, ETS Reports

More than five million ETS tests were administered during the Educational Testing Service's first eighteen months, Henry Chauncey, President, announced in his first annual report. Mr. Chauncey's figures indicate how widespread the use of objective measures in American education has become. In addition to 1,865,246 tests administered by the Educational Testing Service, more than 3,450,000 tests prepared by its Cooperative Test Division were adminis-

(Continued on page 122)

College Board Holds Largest Examinations In Its History

On March 11, the Educational Testing Service administered the College Board's Scholastic Aptitude and Achievement Tests to 37,809 candidates for admission to American colleges.

This impressive number, slightly higher than last year's previous record total, was run up in the face of a predicted ten to fifteen per cent drop in college registrations. Mr. Frank H. Bowles, Director of the Board, commenting on the increase, said that it was too early to say whether last year's slight decline in college applications might be reversed, but it appeared that for many of the 114 member colleges that might well be so.

The ETS engaged 2,000 supervisors and proctors to administer the tests at 600 centers in the United States, its possessions, and 34 foreign countries.

The huge task of scoring the tests was begun on March 13 at Princeton, N. J., and Los Angeles, California. The scores will be sent to the more than 600 member and nonmember colleges to which the candidates are applying for admission. All scores will be in the hands of the colleges within a month of the examination date.

THE COLLEGE BOARD REVIEW

News and Research of the
College Entrance Examination Board

Published from time to time by the
College Entrance Examination Board
425 West 117th Street, New York 27, N. Y.

Director . . . . . Frank H. Bowles

Secretary . . . . . William C. Fels

Five Million Tests—*(Continued)*

tered by schools during the first eighteen months of operation covered in the report. During this period, substantially more than three quarters of a million candidates in the United States took tests for admission to colleges, medical and law schools, graduate schools, and service academies.

ETS' research staff is developing new measures of aptitude and personality to aid in counseling and guidance. Tests and other devices to measure relative attainment of fundamental objectives of education, particularly at the high-school level, are also in the research stage, but Mr. Chauncey expects that it will be three to ten years before these will be ready for general use.

The ETS was formed in 1948 in a merger of the testing activities of the American Council on Education, the Graduate Record Office of the Carnegie Foundation for the Advancement of Teaching, and the College Entrance Examination Board. For the College Board the ETS now conducts research and test analysis, aids the Board's examiners in the construction of tests, and administers the Board's examinations to 70,000 candidates a year wherever in the world they may appear.

Copies of the report may be had from ETS, 20 Nassau Street, Princeton, New Jersey.

Counseling Aids Available From Secretary Of Board

Annual Report of the Director, 1948. Description of Board activities, statistical data, lists of members, representatives, examiners, and readers. One free copy has been sent to each college and school using the Board's examinations. Additional copies $.50. 112 pages.

Bulletin of Information and Sample Tests, 1949–50. Dates of examinations, registration and fees, descriptions of tests, sample questions. Free. 56 pages.

College Board Review. News and Research of the College Entrance Examination Board. Beginning with this issue, Number 10, one free subscription will be entered for each college and school using the Board's tests. Additional subscriptions for schools or individuals will be accepted at $.50 each for the academic year or $1.00 each for two years. Hard-covered, looseleaf binders for the *Review* stamped in gold leaf are available at cost, $2.00.

Terms of Admission to the Member Colleges, Handbook, 1949. One free copy has been distributed to each college and school using the Board's examinations. Additional copies $1.50. 296 pages.

Supplement to the 1949 Handbook—Changes in Terms of Admission to the Member Colleges for 1950. Includes statements describing the part that college preference plays in the admissions practices of the member colleges. Copies of the *Supplement* have been sent to all known holders of the *Handbook* and will be mailed with all new orders. No charge is made for the *Supplement*. 112 pages.

Sixty-two Colleges To Use May 22 Acceptance Date

Sixty-two colleges, twenty-four more than last year, have notified the Secretary of the Board that they will adhere to the May 22, 1950, Uniform Acceptance Date. Dartmouth and Washington and Jefferson, which took part in 1949 when the date was June 15, will not join this year's agreement. The text of the agreement and the participating institutions follow:

The institutions listed below have, by common agreement, bound themselves not to require any candidate admitted as a freshman to give notice before May 22 of his decision to attend one of these institutions or to accept financial aid from it.

This policy has been agreed upon so that a candidate may be able to give consideration to all opportunities available to him. It should be emphasized, however, that whenever a student can reach a decision before this date, he may with propriety notify the institutions.

SUBSCRIBERS TO MAY 22 AGREEMENT

Adelphi College
Barnard College
Bennington College
Bowdoin College
Brown University
Bryn Mawr College
California Institute of Technology
Catholic University of America
Coe College
College of Notre Dame of Maryland
College of William and Mary
Columbia College
Connecticut College
The Cooper Union
Cornell University
Drew University
Dunbarton College of Holy Cross
Emmanuel College
George Washington University
Goucher College
Harvard University
Haverford College
Hollins College
Immaculata College
Manhattanville College of the Sacred Heart
Marywood College
Massachusetts Institute of Technology
Mills College
Mount Holyoke College
Muhlenberg College
Newcomb College of Tulane University
New Jersey College for Women, Rutgers University
Occidental College
Pembroke College in Brown University
Pomona College
Princeton University
Radcliffe College
Randolph-Macon Woman's College
Russell Sage College
Rutgers University
Saint Mary's College, Notre Dame
Scripps College
Simmons College
Skidmore College
Smith College
Stanford University
Swarthmore College
Sweet Briar College
University of California
University of Chicago
University of Pennsylvania
University of Southern California
University of Virginia
Vassar College
Wagner College
Washington and Lee University
Wellesley College
Wells College
Western Reserve University
Wheaton College
Wilson College
Yale University

College Preference Statements

The 1950 *Supplement to the 1949 Handbook, Changes in Terms of Admission to the Member Colleges for 1950,* includes statements of the manner in which the member colleges use the "choice of college" information asked of applicants. (Candidates for the Board's tests indicate on their application blanks their preference—or lack of preference—among the colleges.)

Although some colleges give priority to applicants who list them as unqualified first choice, others use the information only to compute the number of acceptances, or not at all.

The *Handbook* and *Supplement* may be ordered from the Secretary, College Entrance Examination Board, 425 West 117th Street, New York 27, New York. Price, $1.50.

Board Will Meet On April 5

The regular spring meeting of the College Entrance Examination Board will be held on Wednesday, April 5, 1950, at the Biltmore Hotel in New York City. More than two hundred representatives of the hundred and fourteen colleges and nineteen associations of secondary schools which are members of the Board are expected to attend.

Professor Roderic D. Matthews, author of the recent "Education in Arab Countries of the Near East," and Dr. David Wodlinger, who administers the Fulbright Division of the Institute of International Education, will speak at an afternoon conference on the international interchange of students.

College Transfer Students May Be Asked To Take Tests

Of eighty-eight member colleges which have already responded to a questionnaire asking whether they would use the Intermediate Tests for College Students this year, twenty-nine have answered that they will require the tests, twenty-seven will advise but not require applicants to take the tests, and thirty-two will neither recommend nor require them.

In no case will secondary school students be asked to take the examinations, which are at the college sophomore level and which will be used by deans and admissions officers to help predict the success in later college years of students who have completed some of their undergraduate study.

In the list below colleges are included in the "require" or "advise" sections if *any* transfer applicants will be asked to take the tests. The listing does not mean that *all* candidates will be required to take the examinations. Transfer applicants should write directly to the colleges of their choice for more detailed information.

Applications to take the Intermediate Tests on the examination date, May 13, 1950, should be procured from and returned to the Educational Testing Service, Box 592, Princeton, New Jersey, or P. O. Box 2416, Terminal Annex, Los Angeles 54, California, by April 21, 1950, but will be accepted, upon payment of a special service fee for late registration, until May 5, 1950.

REQUIRE INTERMEDIATE TESTS

Amherst College
Barnard College
Chestnut Hill College
Colby College
College of Notre Dame of Maryland
Connecticut College
Dartmouth College
Denison University
Emmanuel College
Harvard University
Hollins College
Lehigh University
New York University
Northwestern University
Princeton University
Rosemont College
Simmons College
Syracuse University
Trinity College (Washington)
Tufts College
Union College
University of Pennsylvania
University of Rochester
University of Virginia
Ursinus College
Wells College
Wesleyan University
Wilson College
Yale University

ADVISE INTERMEDIATE TESTS

Alfred University
Bates College
Boston University
Bryn Mawr College
Catholic University of America
Colgate University
Dickinson College
Drew University
Georgian Court College
Goucher College
Grinnell College
Hamilton College
Haverford College
Hood College
Lake Forest College
Massachusetts Institute of Technology
Muhlenberg College
Pembroke College in Brown University
Radcliffe College
Randolph-Macon Woman's College
Rutgers University
St. Lawrence University
Sweet Briar College
Western Reserve University
Wheaton College
Whitman College
Williams College

College Ability Test Will Be Offered At August 9 Series

To make it possible for admissions officers to test late applicants for advanced standing, the College Board will administer the College Ability Test at the same time and at the same centers as the regular College Board examinations on August 9, 1950. The College Ability Test is similar to the Board's Scholastic Aptitude Test, but is designed for college sophomores rather than high school seniors. It yields two scores, one on verbal comprehension and English expression, the other on quantitative reasoning. The fee for the CAT will be the same at that for the SAT, $6.00.

The August administration will be in addition to the previously announced May 13, 1950, administration of the Intermediate Tests for College Students.

If the August administration proves successful, the Board plans to offer the CAT at all of its regular series next year.

Examiners For 1951 Board Achievement Tests

The College Board's achievement examinations in twelve subject-matter fields are prepared by examining committees ordinarily composed of five members, of whom three represent the colleges and two the secondary schools. The chairman may be a teacher at either the college or secondary school level. To the committees fall the responsibility of planning the examinations, of determining the percentage of questions to be devoted to each aspect of a subject, of preparing and editing the questions, and even of reading proof when the tests reach the printing stage. The committees have at their disposal the excellent test construction, analysis, and research facilities of the Educational Testing Service in Princeton, New Jersey.

BIOLOGY. Mr. Thomas F. Morrison, Milton Academy, *Chairman;* Professor Elso S. Barghoorn, Harvard University; Dr. Rhoda Garrison, Wellesley College; Professor Herbert C. Knutson, Rhode Island State College; Dr. Charles Tanzer, DeWitt Clinton High School, New York, New York.

CHEMISTRY. Professor Stuart R. Brinkley, Yale University, *Chairman;* Dr. Otis E. Alley, Winchester High School, Winchester, Mass.; Professor Nelson F. Beeler, Potsdam State Teachers College, Potsdam, N. Y.; Professor Ina M. Granara, Simmons College; Mr. Warren T. Warnecke, Adelphi Academy.

ENGLISH. Professor Edward S. Noyes, Yale University, *Chairman;* Mr. Charles Rice, Choate School; Professor Edna B. Williams, Smith College; Dr. William R. Wood, Evanston Township High School, Evanston, Ill.

FRENCH. Professor H. Linn Edsall, Wayne University, *Chairman;* Professor Frederick B. Agard, Cornell University; Miss Anne Marie de Commaille, The Spence School; Miss Eleanor L. Michel, Meriden High School, Meriden, Conn.; Miss Eleanor Walker, Barnard College.

GERMAN. Mr. Robert W. Kesler, Phillips Exeter Academy, *Chairman;* Professor Paul G. Graham, Smith College; Professor W. G. Hollman, Princeton University; Dr. Maxim Newmark, Brooklyn Technical High School, Brooklyn, N. Y.; Professor Arthur J. Watzinger, Boston University.

GREEK. Dr. Henry Phillips, Jr., Phillips Exeter Academy, *Chairman;* Dr. William H. Marnell, Public Latin School, Boston, Mass.; Professor James A. Notopoulous, Trinity College, Hartford, Conn.

ITALIAN. Professor Salvatore J. Castiglione, Yale University, *Chairman;* Mr. Francis Baccari, South Philadelphia High School, Philadelphia, Pa.; Professor Joseph De Simone, Brooklyn College; Professor Maria Piccirilli, Vassar College; Dr. Louis Sorieri, New Utrecht High School, Brooklyn, N. Y.

LATIN. Professor Lucius R. Shero, Swarthmore College, *Chairman;* Mr. Harold V. King, Culver Military Academy; Dr. George Land, Newton High School, Newtonville, Mass.; Professor Charles T. Murphy, Oberlin College; Professor John W. Spaeth, Jr., Wesleyan University.

MATHEMATICS. Professor Raymond D. Douglass, Massachusetts Institute of Technology, *Chairman;* Mr. Edwin C. Douglas, Taft School; Professor Maurice L. Hartung, University of Chicago; Mr. Arthur F. Leary, Hyde Park High School, Boston, Mass.; Dr. Frederic H. Miller, The Cooper Union.

PHYSICS. Professor Paul A. Northrop, Vassar College, *Chairman;* Dr. Alexander Efron, Stuyvesant High School, New York, N. Y.; Professor C. L. Henshaw, Colgate University; Professor W. C. H. McQuarrie, Lafayette College; Mr. Howard A. Taber, Hotchkiss School.

SOCIAL STUDIES. Mr. Henry W. Bragdon, Phillips Exeter Academy, *Chairman;* Professor Harry D. Berg, Michigan State College; Dr. Margaret Hastings, New Jersey College for Women; Miss Loretta E. Klee, Ithaca High School, Ithaca, New York; Professor Arthur Link, Jr., Princeton University.

SPANISH. Mr. Donald D. Walsh, Choate School, *Chairman;* Professor Amelia del Rio, Barnard College; Professor Ernest H. Hespelt, New York University; Professor Rose E. Martin, Middlebury College; Mrs. Naomi W. Zieber, Philadelphia High School for Girls, Philadelphia, Pa.

BUILDING THE BOARD'S TESTS

Mary E. Turnbull

This is the third of the series of articles surveying the Board's testing and research programs. Mrs. Turnbull is head of the Test Production Section of the Educational Testing Service. The illustrations by Vincent Malta are adapted from drawings by Jay Rowen and Elizabeth Townsend of ETS.

Every teacher knows that many hours of labor go into the preparation of a good classroom test; yet probably few people realize the enormous amount of work that lies behind the production of a single College Board examination. In fact, Board candidates might derive some comfort from the thought that answering the examination questions is undoubtedly one of the easiest jobs connected with them!

How does a College Board test come into being? We can perhaps see the stages most clearly if we think of a single question or "item." First, the item must be written (usually by a member of the Committee of Examiners for the subject in question) in accordance with the Committee's own specifications for the examination.[1]

[1] For a description of the way in which these specifications are developed, see "Planning the Board's Tests" by Edith M. Huddleston in *The College Board Review*, December 1949.

. . . the item must be written . . .

. . . items are reviewed . . .

If the subject were Social Studies, such an item as the following might be written:

The primary objective of the labor movement in the United States before 1900 was to

1—gain recognition of the right of collective bargaining

2—to secure the adoption of bimetallism

3—end conflict in industry by arbitration

4—persuading Congress to keep the doors open to immigration

5—gain appropriate social legislation

Usually the members of each five-man Committee of Examiners exchange their items by mail for review and criticism and then meet to discuss them.

At the meeting (attended also by a member of the Test Development Department of ETS, who is familiar both with the subject matter and with the techniques of test construction) from one to three hundred items are reviewed in detail. Those that seem appropriate for a Board examination are revised, if necessary, and selected for use, while the rest are discarded.

But at this stage the construction of the test has just begun! The Committee turns the items

over to ETS, where a still further rigorous editing is given the items chosen by the Committee, whose Chairman usually serves as referee of all disputes. After this further scrutiny the item may appear as follows:

The primary objective of the labor movement in the United States before 1900 was to

1—gain recognition of the right of collective bargaining

2—secure the adoption of bimetallism

3—end industrial conflict through arbitration

4—persuade Congress to keep the doors open to immigration

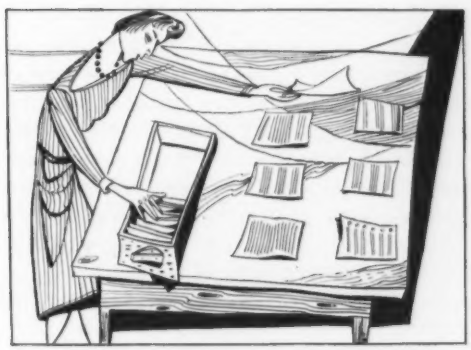
5—win recognition of the "freedom of contract"

When the pretest has been assembled by the section of the ETS Test Development Department especially concerned, it goes to the Test Production Section for a final editorial brushing-up and for typing and proofing.

Next, the pretest (including our original item) is printed and assembled into a neatly sealed test book. Only after all of the above steps have been completed do students have a chance to try to answer the item.

Following the administration of the pretest, the items are scored and each item is subjected to a detailed statistical analysis.

From the analysis of our original item we find that about 60% of the students who took the pretest answered this item correctly and that those who knew the right answer were for the



. . . assembling a pretest comes next . . .

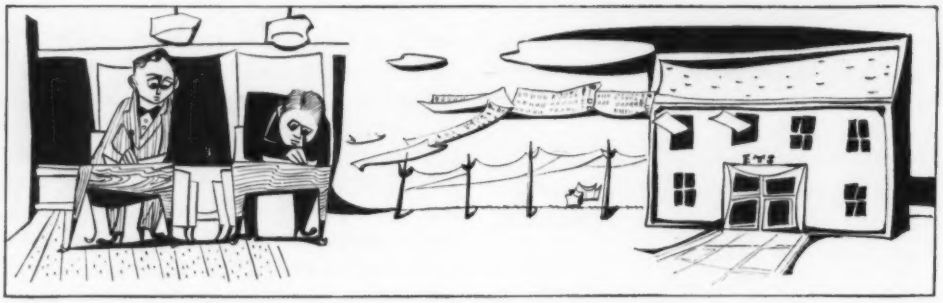
. . . brushing up, typing, and proofing . . .

The next step is to arrange a "pretest" or experimental trial of the items. That is, plans are laid to give the test experimentally to a large group of students (usually several hundred), to score it, and to make detailed analyses of the performance of each test item.

The assembling of the group of items into a pretest comes next. At this stage such questions as the subject-matter distribution and emphasis, the average level of item difficulty, the number of items that students can be expected to answer within a given time limit, and the order in which the items will be presented to them (easiest items first) must be taken into consideration.

most part the better students. We also learn that each of the answer choices in this item has appealed to at least some of the students, for 7% chose choice 2, 13% selected choice 3, 4% considered choice 4 the best answer, and 16% were most attracted by the last choice.

With the item-analysis information at hand, the subject-matter specialists at ETS are ready to select the best of the questions to constitute a tentative final form of the test. This form will include our original item since it proved in the pretest to be within the range of reasonable difficulty and to be useful for selecting good students.



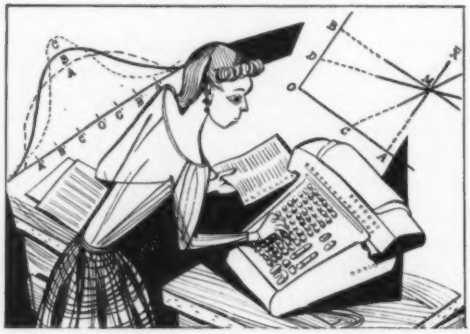
. . . the pretest . . . students have a chance to try to answer . . .

Once again the subject-matter balance and the level of difficulty are considered, as well as the proper number of items for inclusion. This time definite information concerning difficulty is available from the pretest; so in the final form items can be quite accurately placed in order.

When the tentative final form has been put together, typed, proofed, and reproduced at ETS, the Committee of Examiners again meets to review the test and to make final changes. Thus, experts can get an over-all picture of the test and can make sure that their original objectives are being met by the items selected.

After the test has been given the Committee's final seal of approval, it is sent off for final printing. A series of proofs having been checked and rechecked (both at ETS and by members of the Committee), the examination finally comes off the presses and on a specified date is administered all over the country to students who are, understandably, in no mood to appreciate the pains that have been taken to present them with a test of maximum worth!

Anti-climactic though it may appear, there are yet further jobs to be done. After the papers have been scored, each item is again analyzed to determine how successfully it performed in the test itself and the results of the analysis are added to those already obtained from the pretest. And finally, a careful review of the entire examination is made to determine whether the questions were appropriate in number and in difficulty, whether the test succeeded in differentiating with reasonable precision among students of varying degrees of ability, and so on. Information so obtained forms one basis for plans of next year's Committee which sets bravely forth to prepare yet another edition of the test.



. . . a detailed statistical analysis . . .

. . . no mood to appreciate the pains . . .

WHAT IS FACTOR ANALYSIS?

John W. French

John W. French is a Research Associate at the Educational Testing Service and author of a forthcoming Psychometric Monograph on factor analysis. He has risen to the challenge of writing a nontechnical article on this difficult subject.

Are you good at figures, or do you excel at writing? The psychologists of old asked themselves and other people these questions. They pondered over the many ways in which people differ from one another and attempted to list all the traits or faculties of the mind. They introspected. They thought about how they themselves differed from other people; they thought about the differences among their acquaintances. Some of them came up with a list of a half dozen or so basic faculties; others listed hundreds of ways in which people differed.

As psychology evolved into an experimental science, this "arm chair" method of forming theories was greeted with sneers. "Faculty" psychology became a taboo. It was an example of how not to do research.

NEW METHODS DEVELOPED

Time passed and the methods for measuring human differences developed. The IQ test showed that you had a little intelligence or a lot of intelligence. It showed differences in quantity between people; no differences in quality—no faculties.

We taught students Latin, and algebra, and drawing, and we constructed tests to measure how much of each subject the students learned. However, the students who learned anything fast were thought to have a high IQ; those who learned slowly in general were thought to have a low IQ—no faculties.

Now the psychometricians have come up with "factor analysis." This is a mathematical method for helping us deduce what our tests are measuring. The procedure is to give a lot of tests to a lot of students. The results will show that the tests were measuring several "factors." By using some arm chair work, not too much, we can name these factors, say, "Number Factor," "Verbal Factor," "Spatial Factor," and "Deduction Factor."

LOADINGS INDICATE FACTORS

Numbers called "loadings" will indicate how closely related each test is to each factor. The higher the loadings the better the relation; loadings are the same as correlation coefficients. For example, an addition test might have a loading of .80 on Number Factor and loadings of close to zero on the others. In some analyses arithmetic reasoning tests have loadings of about .40 on the Number Factor, .40 on the Deduction Factor, and .40 on the Verbal Factor. To some extent, then, addition and arithmetic reasoning measure the same thing, the Number Factor. The addition test is said to be a pure test of the Number Factor. The arithmetic reasoning test measures three different things at the same time. Since a student will need deductive reasoning ability and verbal ability as well as number ability in college, the arithmetic reasoning test would be a better college entrance test than addition. If we are right about the factors, the arithmetic reasoning test could be replaced without loss by separate pure tests of the Number, Deduction, and Verbal Factors.

What are factors? Presumably they are traits that have some stability in our culture. They are scientifically determined faculties. The more obvious ones resemble the faculties of old, but many of them do not. We can now do more than think deeply in our arm chairs about the structure of the mind: we can think and also use machines—we think that is better.

Factor analysis is a lot of work. Long columns of numbers must be multiplied together or squared and summed, matrices of many hundreds of numbers must be processed again and again, number by number. Machines help, but it is still a tedious process. In spite of cost and time several hundred analyses have been published, each one covering more or less well some group of mental or physical functions. As in most new fields there is much disagreement as to procedure and findings.

After reading numerous analyses to find out what the factors were, I became greatly confused. Therefore, it seemed to me that an appropriate research project would be to compile a survey, cataloguing factor analyses and making comparisons between them to find out whether or not they agreed on anything. This rather voluminous survey has been completed and has been accepted for publication as a Psychometric Monograph, entitled "The Description of Aptitude and Achievement Tests in Terms of Rotated Factors." The conclusion is that many factor analyses do agree.

FACTOR STUDIES AGREE

Here is an example: One analysis found two tests with high loadings on the same factor: (1) a test of learning the initials that go with a list of family names, and (2) a test of learning to associate certain numbers with certain words. Another analysis found the following two tests had high loadings on a factor: (1) a test of learning to associate certain numbers with certain words, and (2) a test of learning to associate pairs of Turkish and English words. It was not hard to see that these two analyses had found the same factor, one that could be called Associative Memory. Since a number of other analyses also find a factor that seems to be Associative Memory, we can conclude that this is a consistent function of the mind, and we know what tests are the best measures of it.

All the factors are not easy to recognize. There seems to be a factor of Integration: integrating many facts in your mind in order to make an appropriate response. Another one seems to be a factor of Planning: reacting to certain facts in advance of action, so that your action will be appropriately planned. These sound very interesting, but the evidence for them is based on a few Air Force tests that we don't know much about. One of the integration tests named Signal Interpretation called for keeping in mind a number of rules and signals in deciding from which drawing of an aircraft carrier planes would next rise.

I look forward to the ideal situation where all the factors of importance to us will be established and where we can have a file of tests for each. When we would suddenly be asked to build a test for, say, tin-can label writers, we could select appropriate factors for the job and pull tests from the files to measure them. There would be no scramble to make up a test that would partly resemble a writer and partly resemble a tin can. Appropriate research would be to obtain ratings in success on the job of tin-can label writing and to make an analysis indicating which factors are important and how they should be weighted in the predictive battery.

We are considering proposals for the development of a battery of tests that could be given at schools and colleges. Such a battery would give us the students' scores on each of fifteen or more well established factors. It would be used to help counselors and students in choosing major fields of study and occupations.

A SAMPLE FACTOR ANALYSIS

Now you have some idea about factor analysis, its limitations and its yearnings. How would you like to try your hand at interpreting a factor analysis? It's not complicated; try it. (If you would be interested in a good text on the subject, technical but clear, try L. L. Thurstone's Multiple Factor Analysis, University of Chicago Press, 1947.)

In the table below you will find the loadings for each test. These indicate how closely each test is related to the factors A, B, C, D, E, F, and

G. Look at the tests that are highly related to factor A: Addition and Multiplication. But the Arithmetic Reasoning test has a low loading. Therefore, this factor (A) does not represent the principal ability needed for mathematics, but only the ability to handle numbers. It has been called the Number Factor.

Can you name the other factors?

C. H. Goodman's Analysis of Thurstone's Primary Mental Abilities Tests

TESTS	FACTORS						
	A	B	C	D	E	F	G
1. Identical Forms. Speed in spotting similar figures.	.12	.30	.36	.03	.27	−.24	−.16
2. Verbal Enumeration. Speed in spotting given type of word.	.05	.29	.06	.21	**.44**	−.31	.13
3. Addition. Speed at adding 2-digit numbers.	**.80**	−.12	.16	−.08	.37	.08	.03
4. Multiplication. Speed at multiplying by single-digit numbers.	**.77**	.08	.13	.12	.30	−.12	.16
5. Completion. Give words to fit definitions.	−.02	.22	.06	.22	**.69**	.28	−.02
6. Same-Opposites. Select synonyms or antonyms.	.01	.13	.04	.25	**.72**	.11	.19
7. Cards. Select drawings of cards rotated but not turned over.	.10	.38	**.76**	−.10	.16	.12	.01
8. Figures. Select drawings of figures rotated but not turned over.	.19	.13	**.77**	.23	.05	.18	.32
9. Word-Number. Recall numbers associated with words.	.07	−.01	.19	**.50**	−.03	.07	.25
10. Initials. Recall initials associated with names.	.00	−.05	.37	**.52**	−.12	.14	.08
11. Letter Grouping. Check set of letters not like other sets.	.20	**.48**	.10	.19	−.03	.27	−.17
12. Marks. Find rule for the location of a mark in patterns.	.07	**.50**	.20	−.05	.02	.06	.13
13. Number Patterns. Find rule to complete number squares.	.30	**.41**	.14	.15	.09	.10	−.14
14. Arithmetic Reasoning.	.21	.34	−.01	−.06	.17	**.52**	.15
15. Number Series. Fill in blanks in number series.	.23	.18	.25	.03	.14	**.59**	.05
16. Mechanical Movements. Questions about movement in drawings.	.22	**.40**	.26	−.25	.21	−.07	.19

In this paragraph I will give you the interpretations of those factors made by the man who carried out the analysis, Dr. Charles H. Goodman, research psychologist of the Adjutant General's Office, Department of the Army. Following the Number Factor is one featuring tests 11–13, all tests requiring the formation of generalized rules; call it Induction. Factor C features Cards and Figures, two tests of spatial relations; call it Space. Factor D features two tests concerned with memorizing associations: Associative Memory. Factor E: good old Verbal, but what is verbal about addition? Be happy that you have no worse problem. Factor F: Arithmetic Reasoning problems and Number Series problems call for the application of principles to specific problems, a kind of reasoning, probably deductive. Factor G: this is called a residual factor; nothing there but a residue after everything else—all the identifiable factors—has been taken away.

Factors A–F are fairly well established. A number of other analyses have found factors that can be identified as the same ones as these. The Scholastic Aptitude Test measures the Deductive Reasoning factor and, to some extent, the Number Factor by the Mathematics section. The Verbal Factor is measured by the Verbal section. We have a Spatial Relations Test. These are related to college success, but how about Induction? How about many other factors that have been found and will be found? These, too, must be studied so that useful measures can be constructed.

REPORT ON COLLEGE NIGHTS

The Director of the Board has opened the pages of the Review *to the College Nights Committee of the Middle States Association of Collegiate Registrars and Officers of Admission. Its report should be of equal interest to school and college officers. J. G. Quick of the University of Pittsburgh was chairman of the Committee which included Irene M. Davis, Johns Hopkins University; Alfred Donovan, Pratt Institute; George Gilbert, Lower Merion High School, Ardmore, Pennsylvania; William J. Phillips, Ursinus College; and John M. Rhoads of Temple University.*

President Elwood Kastner appointed a committee of this Association to study College Nights for two reasons (1) the growing interest in the subject on the part of our members, and (2) suggestions received from high school and college administrators that we conduct such an inquiry. Although College Nights are sponsored by high schools or by groups associated with public schools, they are of concern to us because collegiate registrars and admissions officers usually represent their institutions at these conferences. It was felt, therefore, that this study would be an appropriate Association project.

Most of the members of the committee belong to this Association. However, because of the nature of our subject, we asked a high school principal to join us, so that our findings and conclusions might reflect the experiences and judgments of both of the administrative groups concerned. We appreciate his helpful cooperation.

The first aim of the committee was to become as well informed as possible on the facts concerning College Nights. This was done by reviewing the limited literature on the topic, and by having conferences with principals and counselors in high schools where College Nights are, or have been, held. The second objective was to prepare a report that would be constructively helpful both to high schools and to colleges. Toward this end, all of the evidence, including the opinions of registrars and admissions officers, was examined, and at a committee meeting held at Temple University last month this report was prepared and adopted.

Although there is a variation in the names, program patterns, and procedures of College Nights, the common purpose is to provide opportunity for high school students, or students and their parents, to meet college representatives and receive from them the information usually sought by applicants for admission to college. High schools consider these events as features in their guidance programs, whether they are sponsored by the schools themselves or by affiliated organizations. In some schools the scope of the objective is broadened under the title "Career Night," and to it are invited representatives of the professions and the vocations. Delegates representing individual colleges may, or may not, be invited to Career Nights.

Your committee has not assumed that its assignment included any obligation to make a specific pronouncement for or against College Nights. Its central purpose has been to present the facts, including the expressed opinions both favorable and unfavorable, and to leave any final judgment to those who have the authority to decide. It may be assumed that high schools that are satisfied with College Nights will continue to hold them so long as there is evidence that they serve their purpose. It is equally true that college representatives will continue to attend so long as they are persuaded that the expenditure of time, effort, and money involved is justified. This implies that it is incumbent upon the high schools to study constantly their programs and procedures so that they may be sure that their feeling of satisfaction rests upon a sound, objective base. This is important as, at the close of each of these conferences, college representatives estimate their own effectiveness and the extent to which the program has been a contributing factor.

In our study we have observed that the range of high school attitude extends all the way from complete satisfaction with College Nights to a decision to discontinue them altogether. Principals and counselors who favor the programs give various reasons in support of their conclusions. They claim the following benefits are derived:

1. Interest in college is stimulated.
2. Students and parents have an opportunity to meet college representatives and to obtain first-hand information.
3. Closer unity with the colleges is developed.
4. Attention is focused on high school studies and student achievement.
5. Any weaknesses in high school curricula or guidance are revealed.
6. The interest of high school teachers in the guidance program is enlisted.
7. Parents are encouraged to give more serious thought to their children's college courses, and to the selection of colleges to be attended.

Those who do not favor College Nights offer the following criticisms:

1. The results accruing from these events are not commensurate with the expended effort.
2. In some schools the affair has assumed the proportions of a "show"; in some schools, too much emphasis is placed upon the preliminary assembly at the expense of the group conference period.
3. There is some evidence of the development of competition among colleges as shown by the use of banners and pictorial material the chief purpose of which is to attract attention.
4. Too many uninterested students drift into these meetings and wander from room to room gathering materials intended for serious-minded inquirers.
5. College representatives, too frequently, travel a distance expecting to confer with a number of students only to find that the group did not materialize.
6. In some schools too much of the responsibility for guidance as to college entrance requirements and courses is confined to the College Night program.
7. Students complain that they are not allowed enough time to talk with a sufficient number of college representatives.
8. It is much more effective to invite individual college representatives to visit the high schools and address the students who are definitely interested in college.

From the above, it is apparent that there are arguments on both sides of this question. The statements in opposition to College Nights are not presented by this committee as criticisms of any high school or college. They are included here because they have been brought to our attention. Diversity of opinion necessitated careful committee analysis of all testimony, and we found that most of the objections were directed not so much against College Nights themselves as against certain program details the inclusion or omission of which has had detracting effects. A list of what appear to be the essential elements of the best College Night programs is as follows:

1. College Nights are a part of the high school guidance program, and should not be considered a substitute for it.
2. Considerable student preparation should precede these programs. Preliminary sessions with the students concerned should be held by the school counselor. The reading of college bulletins and discussion of entrance requirements and college courses should be emphasized.
3. A careful method of determining the colleges in which students are interested should be followed. The use of a card on which the student writes his name, and indicates the colleges of his first, second, and third choice is recommended. This information should be used as the basis for

scheduling students for the sessions of the group conference period.

4. The invitation to each college should contain a statement of the nature of the occasion, and the number of students desiring to confer with a representative of the college should be indicated. The inclusion of a list of the names of the students is considered good practice.

5. If there is to be a preliminary assembly, it should not exceed a half-hour in duration, and its program should be in harmony with the fundamental purpose of College Nights. An alternative to the preliminary assembly might be a fellowship period during which the college representatives would have an opportunity to become acquainted with high school officials and teachers.

6. For the convenience of college representatives who must rely upon public transportation facilities, train and bus schedules should be borne in mind when the time for the opening and closing of College Nights programs is decided.

7. To conserve the time and energy of the college representatives, and to avoid the growing number of conflicts in College Nights dates, schools in contiguous locations should combine in holding their programs, or schedule them on successive days. Because of the increase in the number of these events, the clearance of proposed dates through a central State or area agency is recommended.

8. The name College Night clearly implies that the central significant service is that provided by the college representatives. It is obvious, therefore, that careful attention should be given to the planning of the group conference feature of the program. These suggestions reflect good practice:

   a. The presence of a faculty or student committee to greet the college representatives, to supply programs and information, and to direct or conduct them to their rooms, is a desirable introductory service.

   b. The assignment of separate rooms of sizes proportionate to the indicated attendance is important. The use of booths in one large area such as a gymnasium is highly undesirable.

   c. The arrangement of the time schedule has a direct bearing upon the effectiveness of the conferences. If students have designated colleges of first, second, or third choice, then three conference periods should be scheduled. A period of from 35 to 45 minutes should be allowed for each of the student groups. Fifteen minutes may be used for the presentation of general facts concerning the college; the remainder of the period, for questions and answers.

   d. The assignment to each conference room of a faculty or student representative who introduces the college representative to those in attendance, lends an appropriate dignity and orderliness to the occasion. These hosts can render an additional service by attending to the registration of the students. This can be done on lists or cards furnished by the high school or the college. The mailing of bulletins and additional information by the college is thus made possible.

   e. Announcements over a public address system during the conference period should be avoided. From five to ten minutes should be allowed between sessions, the opening and closing of which can be designated by the sound of a buzzer or a bell. The scheduling of one continuous conference session is not desirable because of the disturbance caused by the movement of students into and out of the room.

   f. All interested students in grades 10, 11 and 12, and their parents, should be encouraged to attend College Nights.

g. With a view to integrating the College Night program with the school's counseling service, the topics discussed during the conferences should be reviewed in subsequent guidance sessions in the high schools. Students in need of additional information should be encouraged to write for it, or if convenient, arrange for a personal interview at the college. Having met the college representative, they will be addressing their requests to an acquaintance, rather than to an institution.

9. As a part of their responsibility for the success of College Nights, colleges are urged to observe the following recommendations:
   a. The representative should recognize the fact that his primary function is to assist the high school in the guidance of its college-bound students.
   b. Colleges should be represented, if possible, by an officer of the institution who is fully qualified to render the required service.
   c. If it is necessary to use alumni as college representatives, they should be briefed in advance on the purposes of the occasion, and supplied with complete, up-to-date information.
   d. The services of the college representatives should be maintained on a dignified level. They should avoid those practices which create in the minds of the students the impression that colleges are competing for applicants.
   e. The use of corridors for the display of posters and placards is not favored. The use of sound pictures is discouraged because of their disturbing effect.

In concluding this report the committee feels that it should indicate its awareness of the use in high schools of guidance methods that are considered alternatives for College Nights programs. Among these plans are the following: (1) Regularly scheduled visits of college representatives who confer with college-bound students. (2) Conferences of college representatives with high school guidance officers. (3) Conferences for parents of students. In some schools one of these meetings is held when the children are in the ninth grade; and again, when they are in the twelfth grade. A college representative is invited to attend each of these sessions and to speak on college entrance requirements, courses, etc. These, and similar methods, might well be studied by any high school as it seeks to determine the plan best suited to the local need. Regardless of the means adopted by the secondary schools to bring to their students the facts concerning colleges, the members of this Association are glad to cooperate. It is recommended, however, that all such programs be organized with the main objective in mind to the end that students may be helped, and that college representatives may be aided in rendering the most effective service.

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